

## ABSTRACT OF THE DISCLOSURE

5 A probabilistic input-output system is used to classify media in  
printer applications. The probabilistic input-output system uses at least two  
input parameters to generate an output that has a joint dependency on the  
input parameters. The input parameters are associated with image-related  
10 measurements acquired from imaging textural features that are characteristic  
of the different classes (types and/or groups) of possible media. The output  
is a best match in a correlation between stored reference information and  
information that is specific to an unknown medium of interest. Cluster-  
weighted modeling techniques are used for generating highly accurate  
20 classification results. Within the imaging process, grazing angle illumination  
(i.e., introducing light at an angle of at least 45 degrees to the normal of the  
surface being imaged) provides sufficient contrasts for distinguishing the  
structural features (e.g., paper fibers) of the unknown medium, but  
15 non-grazing illumination may be used when specular measurements are to  
be obtained.